

## ***Interactive comment on “Changing patterns of fire occurrence in proximity to forest edges, roads and rivers between NW Amazonian countries” by Dolors Armenteras et al.***

**Dolors Armenteras et al.**

darmenterasp@unal.edu.co

Received and published: 26 March 2017

Anonymous Referee #1 Received and published: 20 February 2017 This paper analyzes the patterns of fire occurrence outside Legal Amazonia, covering the North-western part of the Amazon basin. They studied the relation of fire activity and their proximity to roads, rivers and forest edge. The results obtained in this paper highlighted the differences in fire occurrence between North and South of the Equator and within the countries analyzed. They also found significant the relation of fire occurrence with roads, rivers and forest edge. The paper is well written and organized, although more information should be included in the methods section.

Major:

C1

- The data sources should be described in more detail. A brief explanation of how the databases of roads and rivers were built must be included in the text, as well as the last year they were updated and their spatial resolution.

Thank you for the suggestion. Indeed, some further explanation will be added regarding the datasets of roads and rivers. Text will change to:

“ A forest/ non-forest map for 2010 derived from the 25 m global PALSAR mosaics produced by the Japan Aerospace Exploration Agency, JAXA from the Advanced Land Observing Satellite (ALOS)/ Phased array Type L-band SAR (PALSAR) data with an accuracy over 84.86% with regional variations (Shimada et al., 2014). For fire data we used the remotely sensed active fire detections from MODIS (MCD14DL, from both Aqua and Terra satellites download from January 2003 to January 2015) through the FIRMS (Fire Information for Resource Management System: Archiving and Distributing MODIS Active Fire Data, Collection 6). We only used data with confidence levels over 30% (nominal and high confidence fires as applied in Armenteras et al., 2016; Chen et al., 2013a). We standardized fire occurrence by the area in km<sup>2</sup> of the unit of analysis, so we used fire density (Number of occurrences per 1000 km<sup>2</sup>) as fire variable. Roads from CIESIN-ITOS (Center for International Earth Science Information Network - CIESIN - Columbia and Information Technology Outreach Services - ITOS - University of Georgia, 2013). This dataset is the best publically available information up to 2010 for the region. The database was built from public domain roads data and has some topology corrected at the national level and the roads joint topologically at the country borders. The approximate scale is 1:250.000. This database shows no roads for Venezuela in the Amazonia, therefore, we removed Venezuela from the analysis of accessibility by roads. USGS HydroSheds data for the river network, a consistent hydrological dataset available from 3 arc second resolution for the region and publically available. The dataset was built from the high-resolution elevation data obtained during a Space Shuttle flight for NASA's Shuttle Radar Topography Mission (SRTM) (Lehner et al., 2008).

C2

- The authors used static maps of roads and forest distribution representative of a certain year (which is not specified in the text) to analyze the patterns of fire activity. Roads and forest cover are very dynamic land covers. Deforestation is an important phenomenon in the study area in this paper, so the uncertainty of comparing fires occurred in 2003 with a forest cover map of 2010 is too high. How can you prove that those fires occurred outside of the forest? I suggest the authors to have a look at the Global forest change map developed by Hansen et al. (2013) as an indication of forest change within the timeframe of this study.

We totally agree with the reviewer on the dynamics particularly with roads development, however currently it does not exist a yearly road dataset available for the region. In fact, the roads database used is a compilation of the best publicly available information from countries national databases comprising information of several years up to 2010. The database was built from public domain roads data and has some topology corrected at the national level and the roads joint topologically at the country borders. Is the best available information. Regarding the 2010 forest year used as a reference, we choose the Jaxa dataset because is currently the forest map with the higher resolution (25m) and minimum cloud problems for the region. Unfortunately, it does only exist for 2007-2010 and we choose the 2010 as a reference point to match year with the roads data. We will clarify this in the manuscript.

- When the authors say "following the approach presented by Kumar et al (2014)" a short explanation of the method would help the reader follow better the methodology, specially when the work by Kumar et al. (2014) is being cited in the manuscript several times.

Thank you for your comment. We regret any confusion caused, we had really explained the Kumar methodology before but perhaps was not in the right order and wrongly cited. We will reorder the methods and bring the citation to the beginning of the methods to clarify this.

### C3

Minor: - Page 3, line 52-53 and page 4, line 66 and 67. The almost same sentence is repeated: "fires in the Amazon occur more frequently in previously fragmented forest and are largely associated with deforestation and forest edges" and "Fire is frequently used for clearing in fragmented forests and is largely associated with forest edges."

We will remove the sentence in page 3

-Page 4 line 75. "But see"? Thank you for the comment, we will correct this.

- Page 4 line 76. Add comma after "In this study" Thank you for the comment, we will correct this.

- Page 5 line 110. There is a typo: interannual it's repeated twice, I guess one of those should read intraannual. Thank you for the comment, we will correct this.

- Page 7, line 145. Add "However, " at the beginning of the sentence: " annual fire density : : ." Thank you for the comment, we will correct this.

- Page 7, line 160. Add "their distance to" before "both roads and rivers" Thank you for the comment, we will correct this.

- Page 8, line 170. Add commas after "On the contrary" Thank you for the comment, we will correct this.

- Page 8, line 192. Define the acronym SST Thank you for the comment, we will correct this.

- Page 9, line 198. In my opinion the authors should choose one of the two: impacted or affected. Thank you for the comment, we will correct this.

- Page 9, line 211. Change "above" with "apart from" before "climate there are : : ." Thank you for the comment, we will correct this.

- Page 9, line 217. When the authors say "However and contrary to this study: : .", which study are you referring to? We will clarify this point, we meant Kumar et al findings.

### C4

- Page 10, line 225. "Departments"? We meant the administrative units, but we will change the word to subregions for clarity.
- Page 10, line 239. "Armenteras and others" should read "Armenteras et al." True. Thank you.
- Page 10, line 239-241. This sentence is repeated, the authors already give this information in lines 234-236. Please remove this sentence. Thank you, we will remove the sentence
- Page 11, line 255. Change "fires" with "fire occurrence" Thank you for the comment, we will correct this.
- Page 11, line 261. Define acronym REDD. Thank you for the comment, we will correct this.

---

Interactive comment on Biogeosciences Discuss., doi:10.5194/bg-2016-532, 2017.